

304-CD-001-003

EOSDIS Core System Project

**Flight Operations Segment (FOS)
Requirements Specification
for the ECS Project
Volume 1: General Requirements**

October 1995

Hughes Information Technology Corporation
Upper Marlboro, MD

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Volume 1: General Requirements**

October 1995

Prepared Under Contract NAS5-60000
CDRL Item 045

SUBMITTED BY

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Preface

This document is a formal contract deliverable with an approval code 1. It requires Government review and approval prior to acceptance and use. This document is under ECS contractor configuration control. Once this document is approved, Contractor approved changes are handled in accordance with Class I and Class II change control requirements described in the EOS Configuration Management Plan, and changes to this document shall be made by document change notice (DCN) or by complete revision.

The changes in the document version are focused on general requirements identified during the FOS detail phase. This is based on discussions with the AM-1 project and other technical meetings.

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Abstract

This document specifies the Level 4 requirements for the Flight Operations Segment (FOS). Volume 1 pertains to the general Level 4 requirements. Volume 2 pertains to the AM-1 mission specific Level 4 requirements.

Keywords: Level 4, Requirement, FOS

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Appendix A. Level 4 Traceability Matrix

Appendix B. Level 4 Attributes

AppendixC. Level 3 & IRD to Level 4 Traceability Matrix

Abbreviations and Acronyms

Glossary

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1. Introduction

1.1 Identification

The Flight Operations Segment (FOS) Requirements Specification for the ECS Project, Contract Data Requirements List (CDRL) item 045, whose requirements are specified in Data Item Description (DID) 304/DV1, is a required deliverable under contract NAS5-60000.

1.2 Scope

The FOS Requirements Specification defines the FOS Level 4 Requirements. The FOS Level 4 Requirements are comprised of two volumes: (1) Volume 1 focuses on the general FOS Level 4 requirements; (2) Volume 2 contains the AM-1 Mission Specific Requirements.

This document reflects the August 23, 1995 Technical Baseline maintained by the contractor configuration control board in accordance with ECS Technical Direction No. 11 dated December 6, 1994. It covers releases A and B for FOS. This corresponds to the design to support the AM-1 launch.

1.3 Purpose

The general requirements are defined as the set of requirements that FOS will provide to support any U.S. EOS spacecraft. These requirements were derived from the Level 3 requirements, as defined in the Functional and Performance Requirements for ECS and Interface Requirements Documents (IRDs). Note that in some cases, a general requirement may not be implemented if a mission specifically does not require the capability. This status will be denoted in Appendix A, Level 4 Traceability Matrix.

The mission specific requirements are defined as the set of requirements that pertain uniquely to support the command and control of a specific U.S. EOS spacecraft. In particular, Volume 2 contains the mission-specific FOS requirements for the AM-1 mission. Note that Volume 2 is organized identical to Volume 1 for consistency purposes. In addition, the subsection titles are identical for easier reference and traceability. In many cases, the subsections are referenced even though mission-specific requirements are not defined for the subsection.

1.4 Status and Schedule

This submittal of DID 304/DV1 incorporates comments received during the Flight Operations Segment Preliminary Design Review (PDR), and is the final submittal of this document. This document is now under ECS CCB control; all changes must be approved by this CCB prior to inclusion in the document.

1.5 Organization

The document is organized to describe the level 4 Flight Operations Segment (FOS) requirements. Section 1 provides information regarding the identification, scope, status, and organization of this document.

Section 2 provides a listing of the related documents, which were used as source information or this document.

Section 3 provides an overview of the FOS, focusing on the FOS high-level operational concept. This provides general background information to put FOS into context.

Section 4 contains the set of FOS segment-wide requirements.

Section 5 contains the FOS hardware requirements.

Section 6 contains the requirements associated with the Scheduling activity phase. This includes the Planning and Scheduling subsystem and the Command Management subsystem.

Section 7 contains the requirements associated with the Real-Time Operations activity phase. This includes the Resource Management, Telemetry and Command subsystems.

Section 8 contains the requirements with the Analysis activity phase. This includes the Analysis subsystem.

Section 9 contains the requirements associated with subsystems that provide services used for the three FOS activity phases. This includes the User Interface subsystem and the Data Management subsystem.

Appendix A contains a table defining whether each level 4 requirements is an IST requirement. Note that the IST requirements are defined in Section 4 through 9 of this volume. In particular, any requirement that includes the text “The FOS shall” pertains to a requirement that is applicable to both the EOC and the IST. Any requirement that includes the text “the EOC shall” pertains to a requirement that is applicable to the EOC, not the IST. Any requirement that also includes the test “the IST shall” also pertains to a requirement that is applicable to the IST. Note that a listing of each of the IST requirements is included in the IST Capabilities Document.

Appendix A also contains the Traceability Matrix for Level 4 requirements to the Release, the Level 3 Requirements, whether the Level 4 requirement is an IST requirement, the test method, and whether the Level 4 requirement will be implemented by CSMS.

Appendix B contains the Level 4 Attributes Matrix.

Appendix C contains the Level 3 to Level 4 Traceability Matrix.

The section Abbreviations and Acronyms contains an alphabetized list of the definitions for abbreviations and acronyms used in this volume.

The section Glossary contains a list of terms used in this volume.

2. Related Documentation

2.1 Parent Documents

The parent document is the document from which this FOS Requirements Specification scope and content are derived.

194-219-SE1-001	Interface Requirements Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI)
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System
505-41-15	Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and Earth Observing System (EOS) AM-1 Flight Operations
505-41-18	Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and MITI ASTER GDS Project
505-41-19	Goddard Space Flight Center, Interface Requirements Document Between the EOSDIS Core System (ECS) and the National Oceanic and Atmospheric Administration (NOAA) Affiliated Data Center (ADC)
540-022	Goddard Space Flight Center/MO&DSD, Earth Observing System (EOS) Communications (Ecom) Interface Requirements Document
560-EDOS-0211.0001	Goddard Space Flight Center/MO&DSD, Interface Requirements Document Between EDOS and the EOS Ground System (EGS) Elements, Preliminary

2.2 Applicable Documents

The following documents are referenced within this FOS Requirements Specification, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this volume.

194-207-SE1-001	System Design Specification for the ECS Project
304-CD-005-001	Release B SDPS/CSMS System Requirements Specification for the ECS Project
604-CD-001-004	Operations Concept for the ECS Project: Part 1-- ECS Overview
604-CD-002-002	Operations Concept for the ECS project: Part 2B -- ECS Release B
604-CD-003-001	ECS Operations Concept for the ECS Project: Part 2A -- ECS Release A
604-CD-004-001	ECS Operations Concept for the ECS Project: Part 2 -- FOS
194-813-SI4-001	Instrument Support Toolkit Prototype Results for the ECS Project

CCSDS 102.0-B-3	Consultative Committee for Space Data Systems (CCSDS) Recommendation for Space Data System Standards -- Packet Telemetry; Blue Book
CCSDS 202.0-B-2	Consultative Committee for Space Data Systems (CCSDS) Recommendation for Space Data System Standards -- Telecommand, Part 2 Data Routing Service; Blue Book
CCSDS 202.1-B-1	Consultative Committee for Space Data Systems (CCSDS) Recommendation for Space Data System Standards -- Telecommand, Part 2.1 Command Operation Procedures; Blue Book

2.3 Information Documents

The following documents are referenced herein and, amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS FOS Requirements Specification.

209-CD-002-002	Interface Control Document Between EOSDIS Core System (ECS) and ASTER Ground Data System
209-CD-003-002	Interface Control Document Between EOSDIS Core System (ECS) and the EOS-AM Project for AM-1 Spacecraft Analysis Software
209-CD-004-002	Data Format Control Document for the Earth Observing System (EOS) AM-1 Project Data Base
313-CD-004-002	Release A CSMS/SDPS Internal Interface Control Document for the ECS Project
410-TD-001-002	ECS User Interface Style Guide
343-TP-001-001	[Instrument Support Toolkit] IST Capabilities Document for the ECS Project
502-ICD-JPL/GSFC	Goddard Space Flight Center/MO&DSD, Interface Control Document Between the Jet Propulsion Laboratory and the Goddard Space Flight Center for GSFC Missions Using the Deep Space Network
530-ICD-NCCDS/MOC	Goddard Space Flight Center/MO&DSD, Interface Control Document Between the Goddard Space Flight Center Mission Operations Centers and the Network Control Center Data System
530-ICD-NCCDS/POCC	Goddard Space Flight Center/MO&DSD, Interface Control Document Between the Goddard Space Flight Center Payload Operations Control Centers and the Network Control Center Data System
530-DFCD-NCCDS/POCC	Goddard Space Flight Center/MO&DSD, Data Format control Document Between the Goddard Space Flight Center Payload Operations Control Centers and the Network Control Center Data System

540-041	Interface Control Document (ICD) Between the Earth Observing System (EOS) Communications (Ecom) and the EOS Operations Center (EOC), Review
560-EDOS-0230.0001	Goddard Space Flight Center/MO&DSD, Earth Observing System (EOS) Data and Operations System (EDOS) Data Format Requirements Document (DFRD)
ICD-106	Lockheed Martin, Interface Control Document (ICD) Data Format Control Book for EOS-AM Spacecraft
SD-110a	Lockheed Martin, EOS-AM Spacecraft Flight Software -- Software Requirements Specification
none	Goddard Space Flight Center, Earth Observing System (EOS) - AM1 Flight Dynamics Facility (FDF)/EOS Operations Center (EOC) Interface Control Document (ICD), Draft
none	Goddard Space Flight Center, EOS AM-1 Ground Systems Requirements
none	Goddard Space Flight Center, Detailed Mission Requirements AM-1 Spacecraft

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